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HOSPITAL BUILDING NOTE

THE DISTRICT GENERAL HOSPITAL

3

MINISTRY OF HEALTH
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MINISTRY OF HEALTH

BUILDING NOTE NO. 3

The District General Hospital

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I. Scope

Building Note No. 1 indicates the trend towards the greater integration of the various branches of medicine.

This Building Note No. 3 is intended to introduce this concept to newcomers to hospital design. It examines briefly the commoner departments of a district general hospital, the important relationships between them and the arrangement of the whole. The content and arrangements of individual departments are described in other Building Notes.

This note is not intended in any way to diminish the need for an adequate brief for the designer, based on a careful study of local needs and conditions.

II. Departments

The major departments of a district general hospital considered below are:

(i) Central
  (*a*) Administration
  (*b*) Medical records

(ii) Wards

(iii) Operating theatre suites

(iv) Diagnostic and treatment facilities
  (*a*) Casualty and admission department
  (*b*) Out-patient department
  (*c*) Diagnostic X-ray department
  (*d*) Pathology department
  (*e*) Physical medicine department
  (*f*) Pharmacy

(v) Special departments
  (*a*) Maternity department
  (*b*) Paediatric department
  (*c*) Psychiatric department
  (*d*) Geriatric department
  (*e*) Isolation unit

(vi) Hospital services
  (*a*) Central sterilisation and supply department
  (*b*) Catering department
  (*c*) Central stores
  (*d*) Mortuary
  (*e*) Laundry

(vii) Boiler plant

(viii) Provision for engineering services

(ix) Staff accommodation

The features of these departments and the relationship between them are now considered.

(i) Central

(*a*) *Administration*

This department contains offices for the administrative staff of the hospital, committee rooms, etc. It is also the receiving point for visitors and should have simple access to all departments. In some hospitals the offices of the Hospital Management Committee may be included with the hospital administration.

(*b*) *Medical records*

This is an important department where patients' active medical records are processed and stored. It also includes accommodation for medical secretaries. Because of the space needed for medical records, it is usually necessary to provide other accommodation away from the main department for the storage of older records. The medical records department is best located adjacent to the out-patient department rather than in relation to the in-patient reception point (for booked admissions) since in-patient admissions and discharges make less call on it than the out-patient service.

(ii) General wards

Figure 1 illustrates the main communications to other departments.

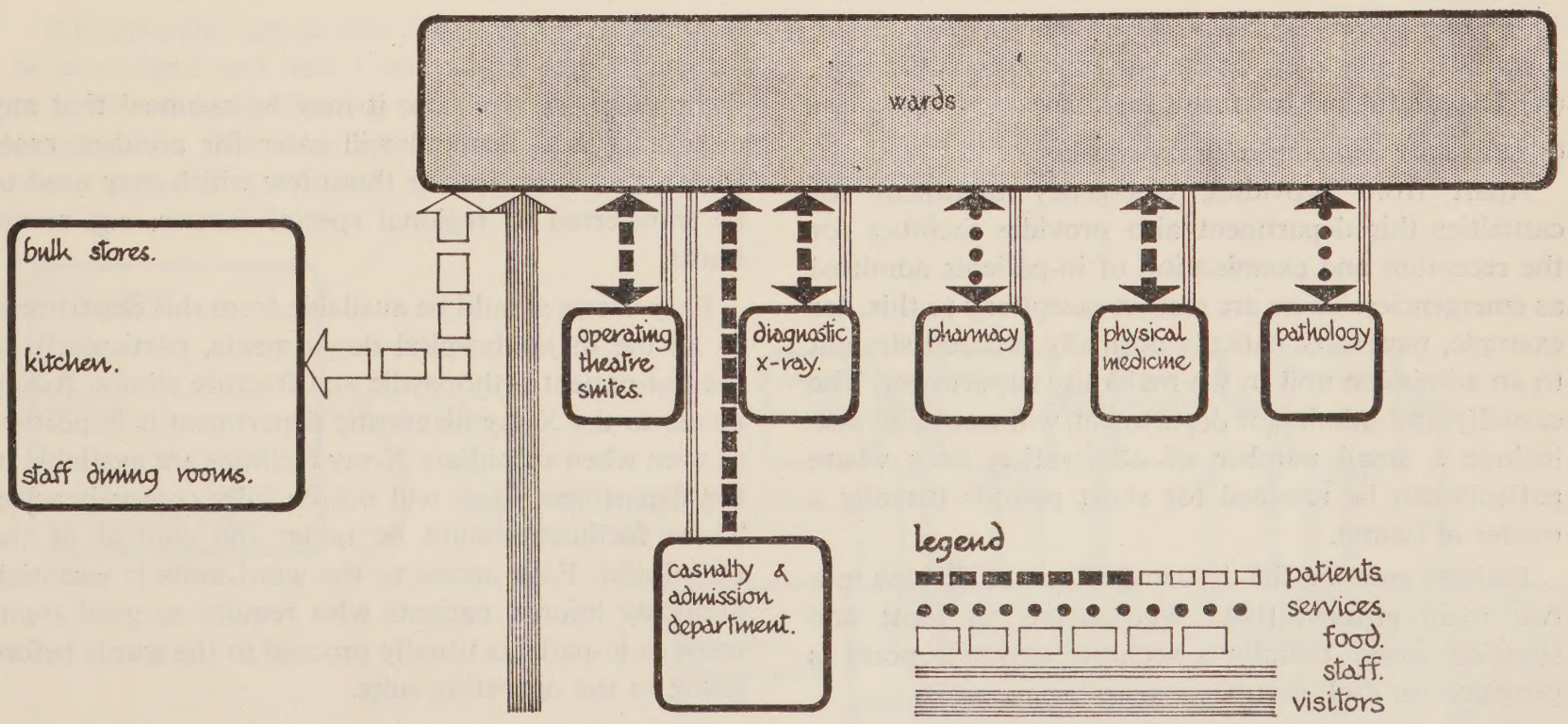

FIGURE 1. Wards

Patients are admitted to the wards in two ways: as emergencies, through the casualty and admission department; or by pre-arranged admission from the waiting list.

The district general hospital will contain wards for the medical and surgical specialties (including possible use by general practitioners), including gynaecology. For the most part wards will be of a standard pattern, but wards for psychiatric, maternity and paediatric patients will require special planning. There may also be beds for private patients, staff, etc. The Building Note on Ward Units refers to possible changes in nursing techniques which will influence ward design in the future.

The departments to which patient access should be direct are the operating theatre suite, X-ray, and physical medicine departments. The pharmacy and pathology departments should also be readily accessible to the wards for convenience of staff.

Deliveries of patients' meals and other supplies will be made to the wards from the kitchen, central sterilisation and supply department. central linen store and the central stores.

(iii) Operating theatre suites

Operating suites should be planned with easy access to the surgical wards and central sterile supply department. It should be noted that in the larger departments there is a trend towards the provision of simple laboratory facilities within the operating suite. It is also normal to make provision for X-ray examinations in the theatres by means of either fixed or mobile apparatus. This reduces the need to site operating suites near the X-ray and pathological departments. It is desirable to group theatres together on the same floor (possibly in a single-storey building) to ensure freedom in planning. Although access must be easy, the grouped theatres must be so arranged as to exclude all inessential traffic.

Figure 2 illustrates the main communications to other departments.

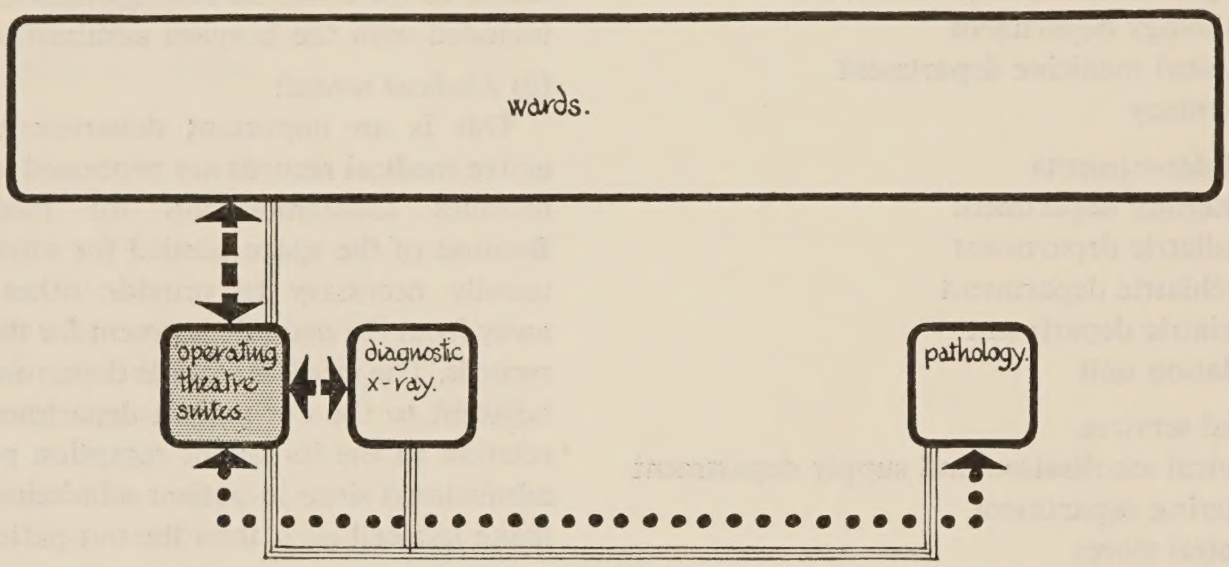

FIGURE 2. Operating theatre suites

(iv) Diagnostic and treatment facilities

(*a*) *Casualty and admission department*

Apart from providing emergency treatment for casualties this department also provides facilities for the reception and examination of in-patients admitted as emergencies. There are certain exceptions to this; for example, maternity patients normally proceed straight to an admission unit in the maternity department. The casualty and admission department will normally also include a small number of observation beds where patients can be retained for short periods (usually a matter of hours).

Patients entering the department can be divided into two main groups: those who arrive on foot; and stretcher cases. Usually a separate entrance point is provided for each group.

The future trend will probably be to concentrate accident cases in a limited number of hospitals, but, for the present, at any rate, it may be assumed that any district general hospital will cater for accident cases from its area, except for those few which may need to be transferred to regional special centres, e.g. severe burns.

Easy access should be available from this department to all the major hospital departments, particularly to the out-patient orthopaedic and fracture clinics. Ready access to the X-ray diagnostic department is important as even when subsidiary X-ray facilities are available in the department these will not be fully comprehensive. These facilities should be under the control of the radiologist. Easy access to the ward units is essential. Seriously injured patients who require surgical treatment as in-patients usually proceed to the wards before going to the operating suite.

Figure 3 illustrates the main communications to other departments.

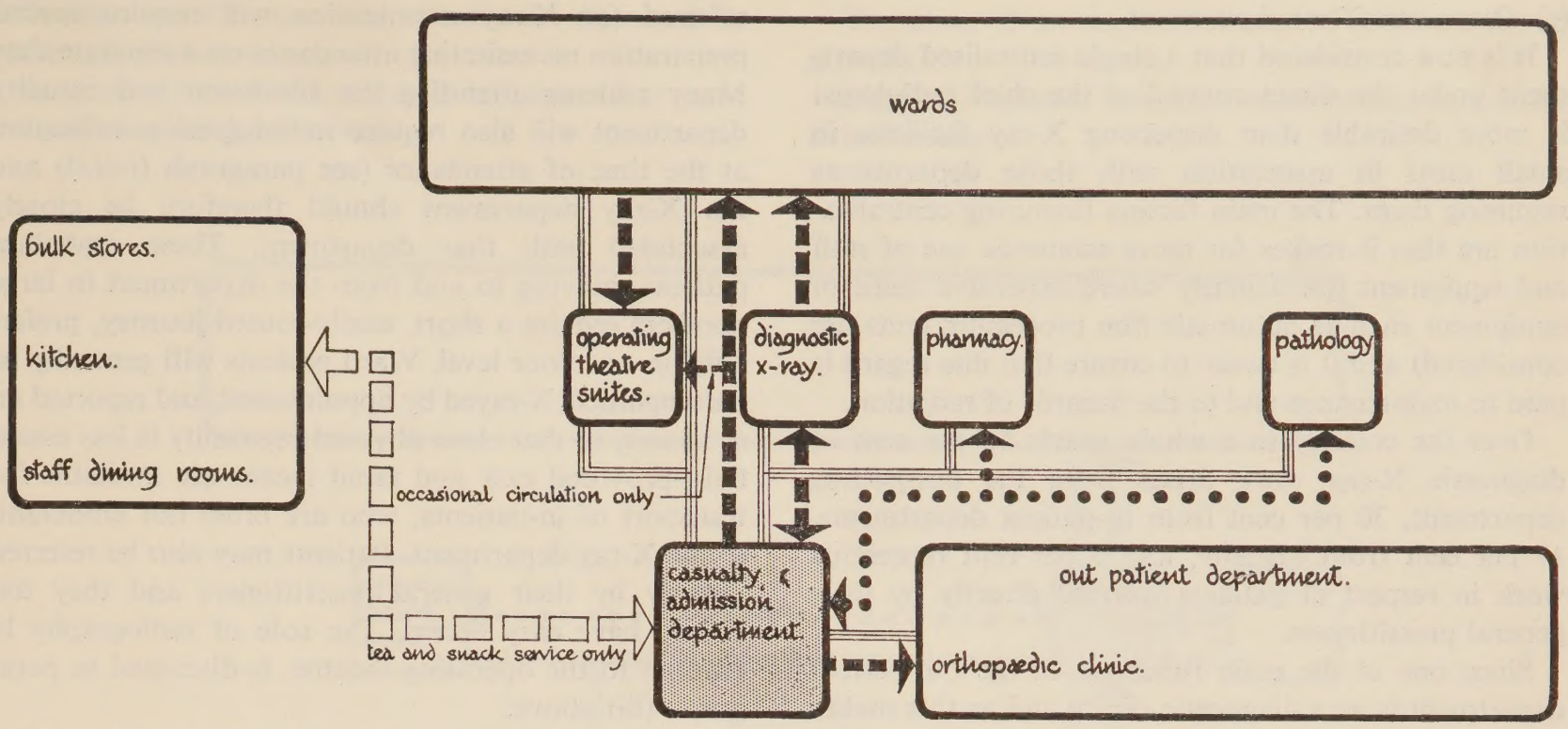

FIGURE 3. Casualty and admission department

(*b*) *Out-patient department*

The range of work which can be carried out in out-patient departments is increasing, and there is every indication that they will assume greater importance in the hospital service of the future.

Out-patient departments are usually planned as part of the general hospital. Patients are referred by general practitioners for consultation with hospital specialists. The investigation and treatment of out-patients can be undertaken either within the department or in the related diagnostic and treatment departments such as X-ray, pathology and physical medicine. A current trend is the development of a day patient service to enable some of the more complex diagnostic and treatment procedures to be undertaken in the out-patient department. This requires the provision of minor operating theatres, treatment room, recovery beds and day rooms in the out-patient department.

Sub-division of the department into clinics catering for the various ailments is dependent on the size of the hospital and local requirements.

It is generally agreed that out-patient facilities should be centralised and that a centralised department is to be preferred to the linking of clinics with their appropriate wards. There are some exceptions to this, however, such as ante-natal and, possibly, paediatric clinics, and clinics which require expensive equipment also used for in-patients.

There should be one entry point for out-patients. The out-patient department should be closely related to the specialist diagnostic and treatment departments such as X-ray, pathology, and physical medicine; and it is of advantage for the orthopaedic and fracture clinics to be directly related to the casualty department.

For diagnostic purposes great use is made of the pathology department, but although a small proportion of out-patients will have to attend the department, ease of communication is less essential than in the case of the X-ray department, especially if facilities are available within the out-patient department for the collection of specimens.

The medical records department and pharmacy should, if possible, be planned in close association with the out-patient department. In cases where it is impracticable for the pharmacy to be directly related to the out-patient department it will generally be necessary to provide a separate dispensary for out-patients within the department itself.

Because of the trends towards greater use of out-patient departments the design must allow freedom for alterations and growth.

Figure 4 illustrates the main communications to other departments.

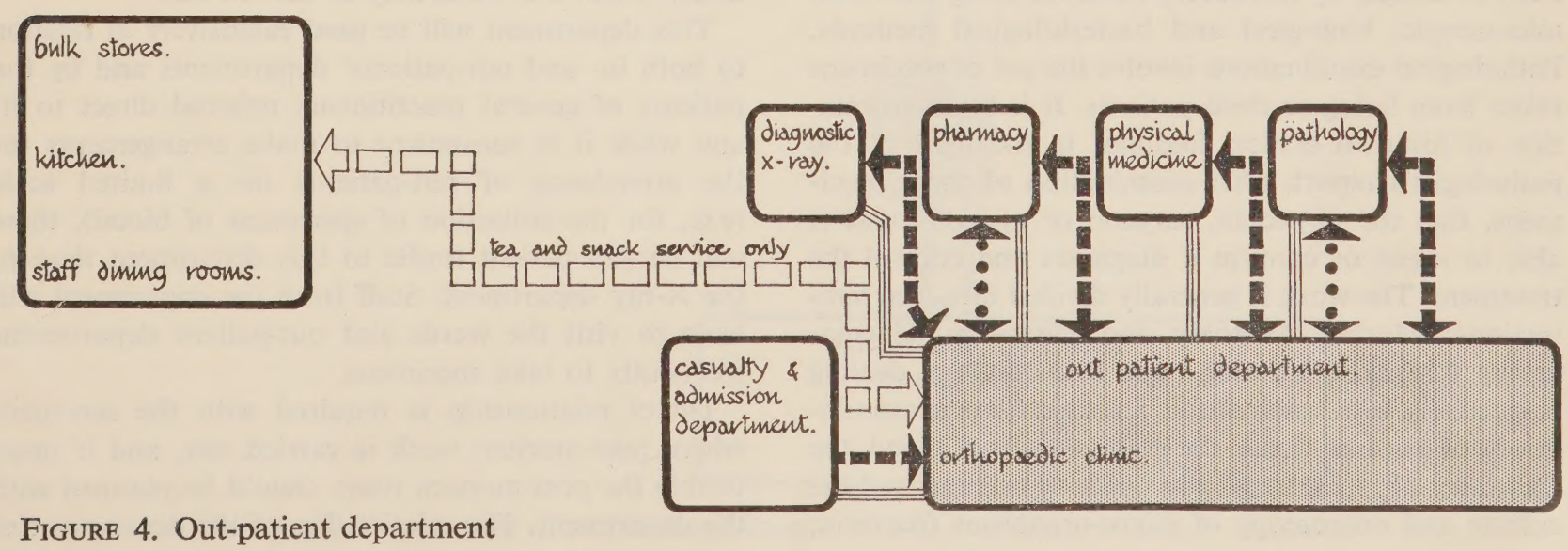

FIGURE 4. Out-patient department

(*c*) *Diagnostic X-ray department*

It is now considered that a single centralised department under the direct control of the chief radiologist is more desirable than dispersing X-ray facilities in small units in association with those departments requiring them. The main factors favouring centralisation are that it makes for more economic use of staff and equipment (particularly where expensive items of equipment such as automatic film processing units are considered) and it is easier to ensure that due regard is paid to maintenance and to the hazards of radiation.

Over the country as a whole nearly 50 per cent of diagnostic X-ray work arises from the out-patient department, 30 per cent from in-patient departments, 11 per cent from casualty, and 9 per cent represents work in respect of patients referred directly by their general practitioners.

Since one of the main functions of the out-patient department is as a diagnostic centre and as this makes heavy demands on the X-ray facilities, close association between the diagnostic X-ray department and the out-patient department is most desirable although it must be appreciated that a proportion of out-patients referred for X-ray examination will require special preparation necessitating attendance on a separate day. Many patients attending the admission and casualty department will also require radiological examination at the time of attendance (see paragraph (iv)(*a*)) and the X-ray department should therefore be closely associated with that department. These ambulant patients, moving to and from the department in large numbers require a short, easily-routed journey, preferably on one floor level. Ward patients will generally be accompanied, X-rayed by appointment, and reported on at leisure, so that close physical proximity is less essential—provided easy and rapid means are available for transport of in-patients, who are often not ambulant, to the X-ray department. Patients may also be referred directly by their general practitioners and they too should have easy access. The role of radiography in relation to the operating theatres is discussed in paragraph (iii) above.

The siting of the department should allow for future growth.

Figure 5 illustrates the main communications to other departments.

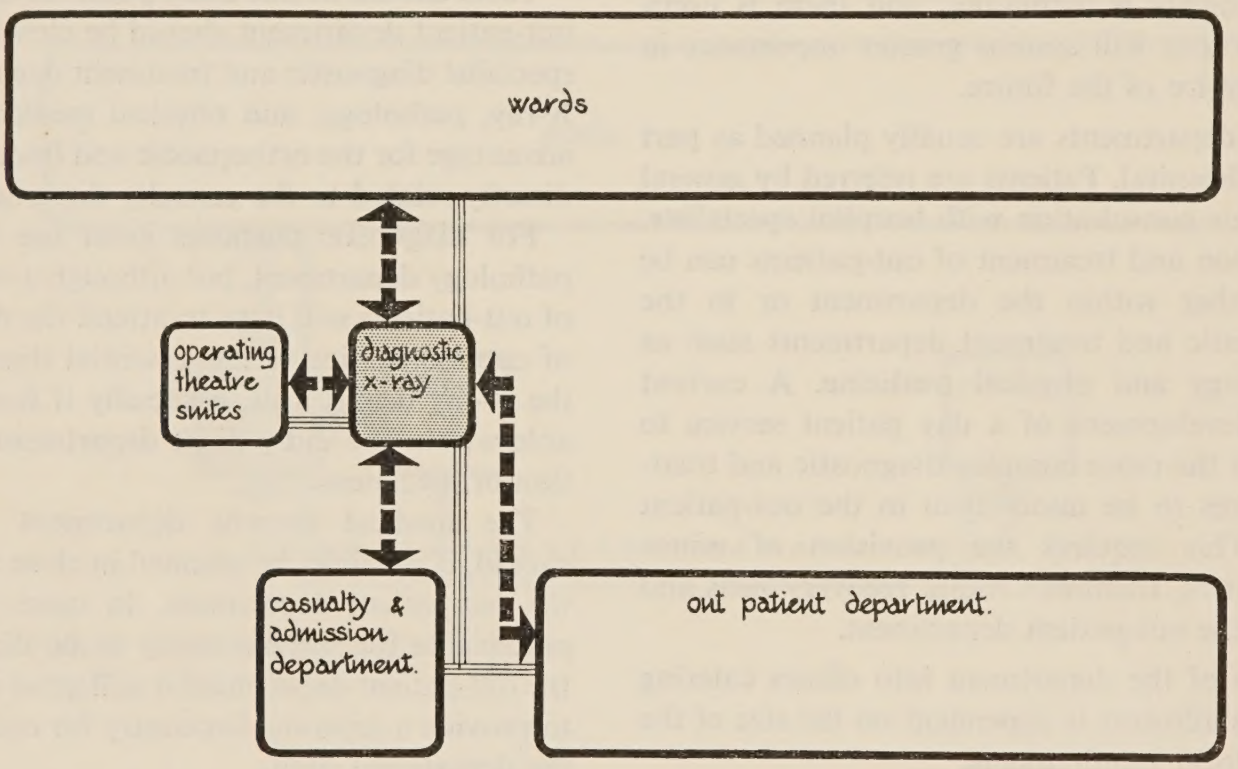

FIGURE 5. Diagnostic X-ray department

(*d*) *Pathology department*

Pathology is that division of medical science which deals with the investigation of the causes and manifestations of disease by laboratory methods using chemical, microscopic, biological and bacteriological methods. Pathological examinations involve the use of specimens taken from living or dead patients. It is by interpretation of his own clinical findings, in the light of the pathologist's report, after examination of these specimens, that the physician, surgeon or gynaecologist is able to make or confirm a diagnosis and control the treatment. The work is generally divided into four subsections: Morbid Anatomy and Histology, Haematology, Chemical Pathology, and Microbiology, dealing respectively with macroscopic and microscopic examinations of diseased tissue, the examinations of blood, the chemistry of blood and body fluids or excreta, and the culture and microscopy of micro-organisms (bacteria; protozoa; fungi; viruses). The department is in effect a suite of laboratories providing the specialised conditions under which this work may be carried out.

This department will be used extensively in relation to both in- and out-patients' departments and by the patients of general practitioners referred direct to it; and while it is convenient to make arrangements for the attendance of out-patients on a limited scale (e.g., for the collection of specimens of blood), there will be less patient traffic to this department than to the X-ray department. Staff from the department will have to visit the wards and out-patient departments frequently to take specimens.

Direct relationship is required with the mortuary where post-mortem work is carried out, and if practicable the post-mortem room should be planned with the department. The relationship of the department of

pathology to the operating theatre is discussed in paragraph (iii) above.

An animal house will normally be required to serve the pathological laboratories.

The siting of the department should allow for future growth.

Figure 6 illustrates the main communications to other departments.

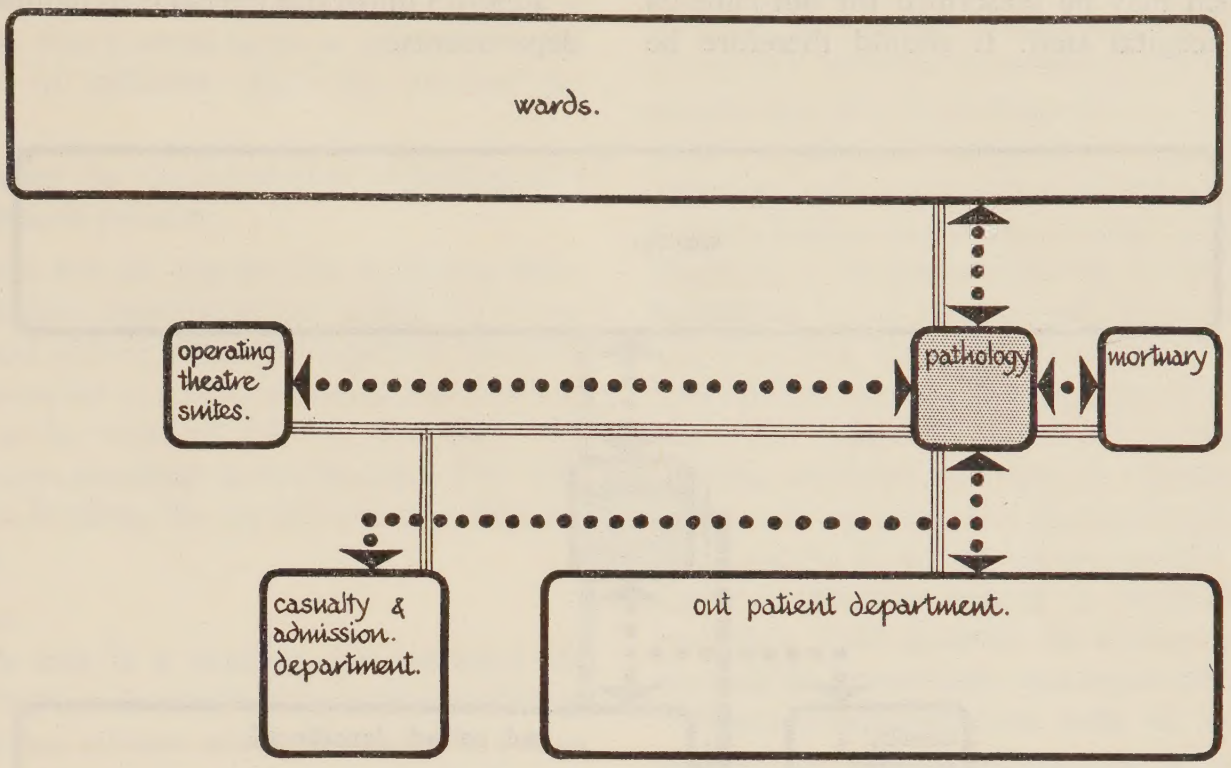

FIGURE 6. Department of pathology

(e) Physical medicine department

This department is divided into three main sections; consultation, physiotherapy and occupational therapy. The physiotherapy section will normally comprise a series of treatment cubicles for massage, heat, electrotherapy, etc., and a gymnasium for exercises and rehabilitation. At the main centres provision for hydrotherapy (normally a small pool) will usually also be included. The occupational therapy section will include light and heavy workshops as well as facilities for domestic training (e.g. rehabilitation of disabled housewives). More extensive rehabilitation facilities will be provided at selected centres.

The majority of patients receiving treatment in this department will be out-patients, but ready access for in-patients is necessary and staff frequently visit the wards.

Whenever possible this department should be provided on the ground floor, as many of the patients attending the department will be suffering from a disability which makes it difficult for them to climb stairs or steps.

Figure 7 illustrates the main communications to other departments.

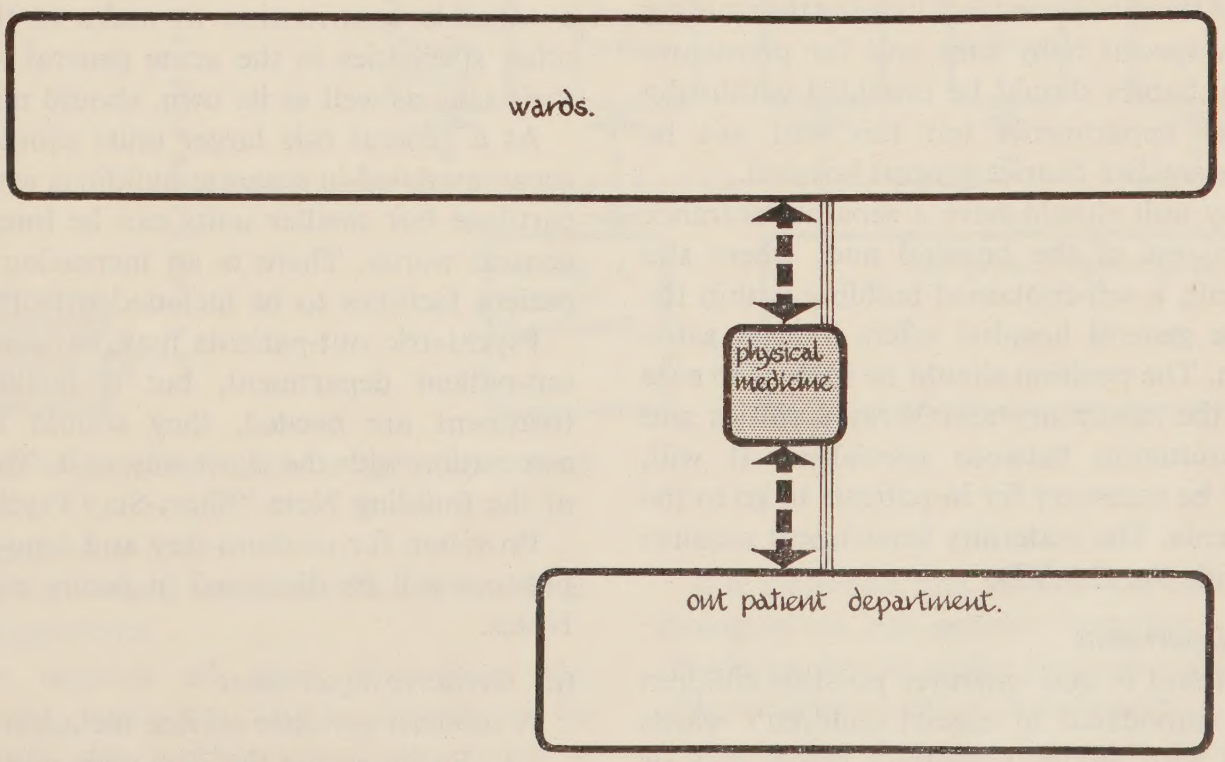

FIGURE 7. Department of physical medicine

(f) Pharmacy

This is required for the custody of drugs and other medical supplies, and the dispensing of prescriptions for in-patients and out-patients.

Items are supplied to the wards in large numbers and the department is also responsible for supplying any drugs, etc., which may be prescribed for out-patients direct by the hospital staff. It should therefore be easily accessible from the out-patient department. If, exceptionally, this is impracticable a small sub-dispensary will be needed within the out-patient department.

The reception of bulk supplies from vans and lorries must be considered.

Figure 8 illustrates the main communications to other departments.

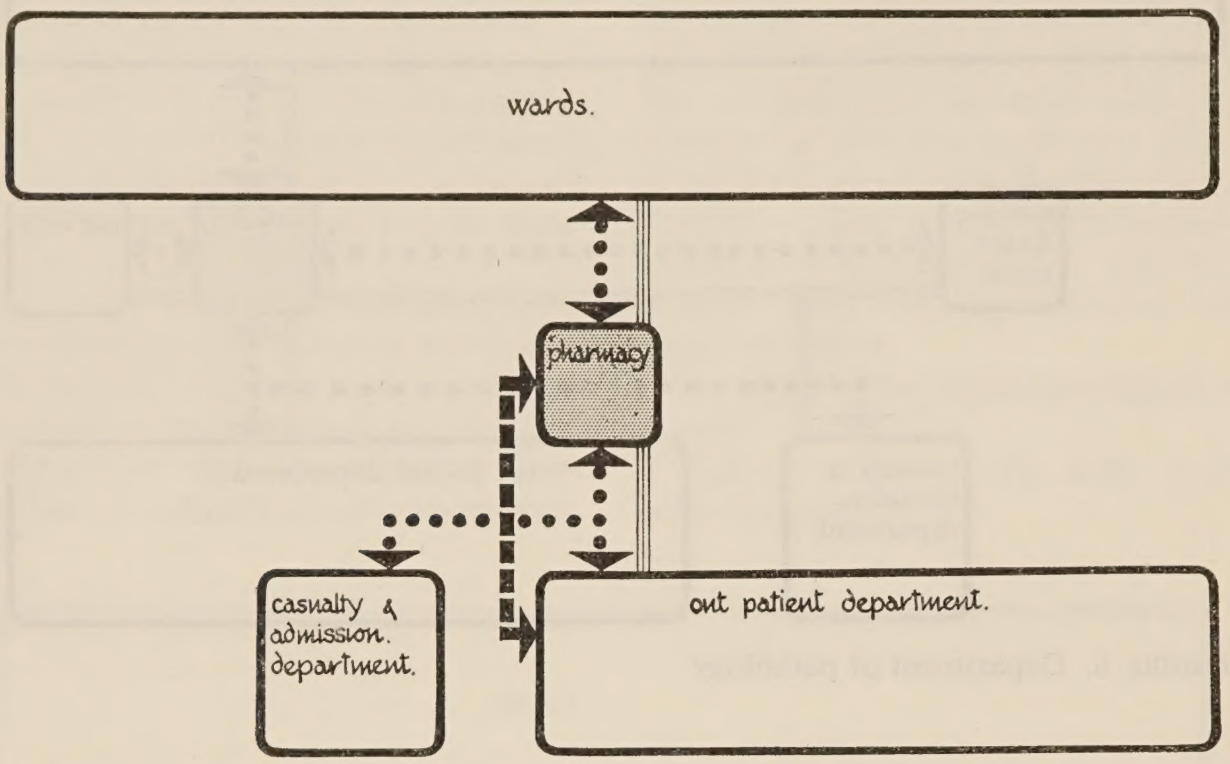

FIGURE 8. Pharmacy

(v) Special departments

(a) Maternity department

This department provides facilities for the confinement in hospital of expectant mothers (both normal and abnormal cases), and for the ante-natal in-patient treatment of abnormalities of pregnancy.

In addition to the wards and delivery suites it is necessary to provide an ante-natal clinic. This will usually be required solely for ante-natal purposes but in a smaller hospital it may be used also for gynaecology or some other purposes. The larger departments will also need to have their own operating theatre and in addition most of them will need facilities for the training of midwives. A special baby care unit for premature and some ailing babies should be provided within the larger maternity departments but this will not be necessary in the smaller district general hospital.

The maternity unit should have a separate entrance apart from the rest of the hospital and, where site conditions permit, a self-contained building within the curtilage of the general hospital offers a most satisfactory solution. The position should be such as to ease the sharing of the laboratory and X-ray facilities and encourage consultation between specialists. It will, however, rarely be necessary for in-patients to go to the X-ray departments. The maternity department requires a direct link with the C.S.S.D.

(b) Paediatric department

The current trend is that wherever possible children should be accommodated in special children's wards and not mixed with adults. Children's wards may or may not be integrated with the general wards, but in any event they should be planned so as to provide ready access to the operating theatres, X-ray department, and other diagnostic and treatment departments.

(c) Psychiatric department

The aim should be to provide psychiatric departments at general hospitals to such an extent that the bulk of psychiatric patients needing diagnosis and/or short-term treatment can in future be admitted to general hospitals rather than to specialised psychiatric hospitals. There are two main reasons for this. First, mental hospitals are commonly too far from the population to be served, and secondly, psychiatry has a valuable contribution to make to the work of the other specialties in the acute general hospital and for their sake as well as its own, should not be isolated.

As a general rule larger units should preferably be accommodated in separate buildings within the hospital curtilage but smaller units can be integrated with the general wards. There is an increasing trend for day-patient facilities to be included with psychiatric units.

Psychiatric out-patients may be seen in the general out-patient department, but if facilities for special treatment are needed, they should be provided in association with the short-stay unit. This is the subject of the Building Note "Short-Stay Psychiatric Unit".

Provision for medium-stay and long-stay psychiatric patients will be discussed in future separate Building Notes.

(d) Geriatric department

A modern geriatric service includes:

1. Facilities for the diagnosis and intensive treatment of illness arising in certain elderly patients.

This is often referred to as the geriatric assessment unit. It uses the full diagnostic and treatment resources of a general hospital.

2. Rehabilitation facilities to give elderly invalids the prolonged treatment they may need to regain maximum independence after illness and to reduce helpless incapacity in all ages to a minimum. Much importance is attached to the provision of sufficient space for physical retraining.
3. Facilities for the long-term care of bedfast and frail ambulant patients.

No firm pattern has yet emerged for providing these services. The facilities mentioned at 1 and 2 above are clearly part of the activity of a district general hospital. They may be provided in a self-contained unit planned to enable use to be made of the full diagnostic and treatment resources provided by the hospital. This unit may also include facilities for out-patients attending for daily treatment.

(*d*) *Isolation unit*

The isolation unit is a nursing unit intended for occupation by both male and female patients suffering from any infectious ailment which precludes or makes undesirable their admission to the general wards.

Isolation units are normally planned as separate buildings away from the main hospital with generous open space and access from roads away from those serving the main hospital.

The degree of isolation demanded in future may well be less. In some countries the isolation unit is commonly found in the main ward block. Such special precautions are needed, however, to prevent the transfer of infection that this solution is unlikely to commend itself here.

(vi) Hospital services

(*a*) *Central sterilisation and supply department*

Up to the present the sterilising of instruments and other articles has been carried out within each department of a hospital, but recently there has been a movement towards centralising the work in central sterilisation and supply departments. The advantages of such centralisation fall under two heads. First, it allows better use and supervision of the plant and this provides a more certain means of ensuring proper sterilisation. Secondly, it facilitates economy in the expensive plant demanded by up-to-date techniques as well as in the use of trained staffs. For these reasons centralisation is likely to become standard practice, at least for much of the work. This department will be required to store, sterilise, maintain and issue as necessary those instruments and materials and garments which are required to be sterile. It should be emphasised that it may be liable to extensive change in methods and scope of operation, with possibly the increasing use of cheap expendable instruments, materials and garments.

Direct communications with all wards, operating theatres, out-patient and casualty departments and, to a lesser extent, X-ray and pathology departments, is required.

A possible development is the greater concentration of central sterilising and supply services so that at selected hospitals the department will provide a service of certain types of supply for a number of other hospitals.

Figure 9 illustrates the main communications to other departments.

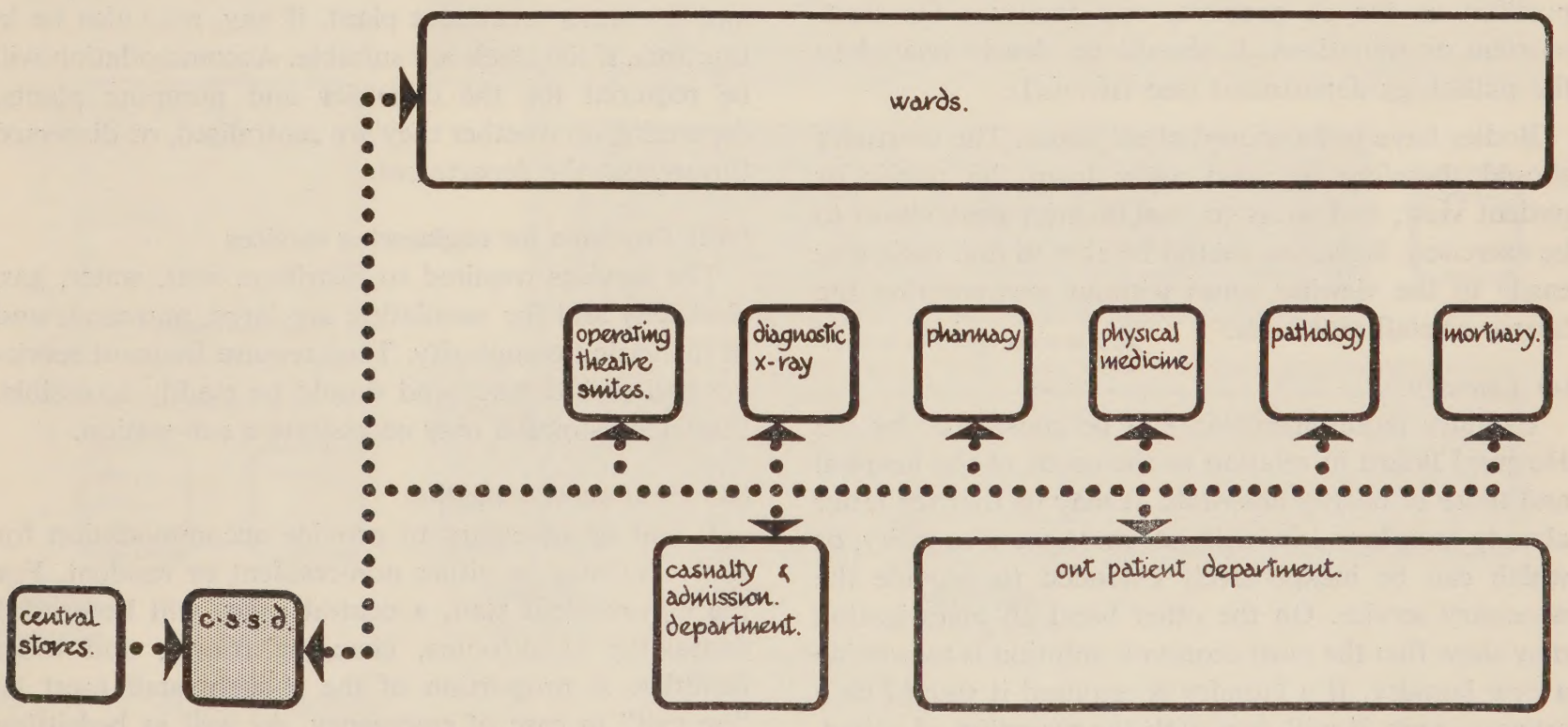

FIGURE 9. Central sterilisation and supply department

(*b*) *Catering department*

The catering department comprises the kitchen, bulk stores and dining-rooms.

The kitchen supplies all meals throughout the hospital. Patients' meals are usually distributed by means of heated trolleys. Direct and easy access is required from the main kitchen to all wards.

It is preferable that the kitchen, bulk stores and staff dining-rooms are grouped together. The department should be sited to ensure that noise and odours are not objectionable to other departments.

Figure 10 illustrates the main communications to other departments.

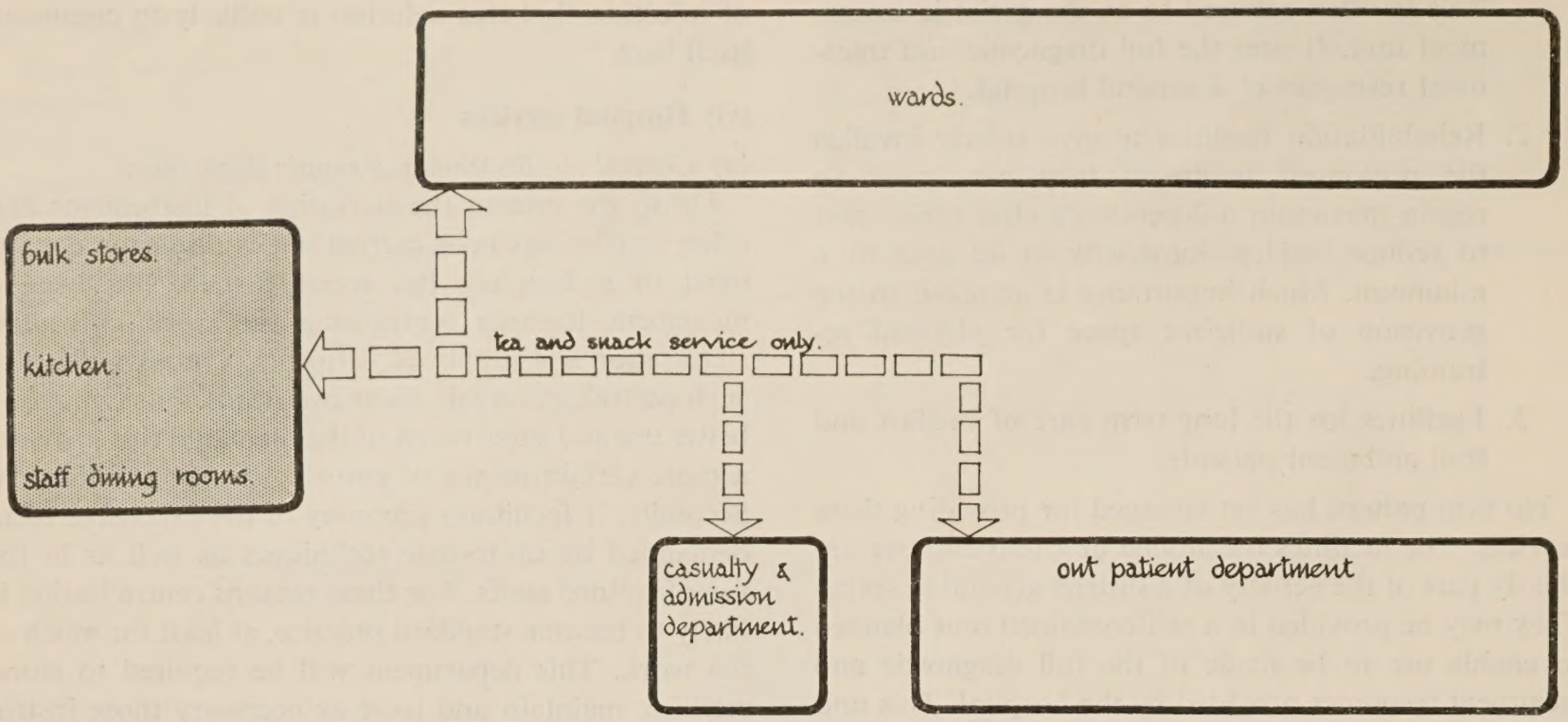

FIGURE 10. Catering department

(*c*) *Central stores*

This department receives, stores and issues bulk items which can with advantage be stored centrally, such as furniture and housekeeping supplies but not specialised supplies such as pharmaceuticals. Within the general storage area it is usual to provide a central linen store which should include facilities for repair.

The stores may conveniently be sited with other departments, e.g. kitchen, workshops, etc., so that all goods enter the hospital in one place.

(*d*) *Mortuary*

The mortuary provides viewing space for relatives, storage for bodies in such a manner as to arrest decomposition as far as possible, and facilities for post-mortem examinations. It should be closely related to the pathology department (see II(iv)(*d*)).

Bodies have to be moved at all hours. The mortuary should therefore be sited away from the public or patient view, and so as to enable strict supervision to be exercised. Relatives should be able to find their way easily to the viewing room without encountering the hearse or staff entrances.

(*e*) *Laundry*

Laundry requirements should be considered by the Hospital Board in relation to the needs of the hospital and those of nearby hospitals. It may be that the latter already have laundries with adequate spare capacity, or which can be inexpensively extended to provide the necessary service. On the other hand an investigation may show that the most economic solution is to provide a new laundry. If a laundry is required it should be a separate unit. It will deal with the reception of soiled, infected and foul hospital linen, which is disinfected, washed, dried, ironed, repaired and returned to the various hospitals, to the central linen store, or to departments. The laundry department, as a major heat user, should be sited near the boiler plant, but heat, dust and noise from the latter should not be transmitted to the laundry building. It should have easy access to the main service roads of the hospital. If a hospital does not have a laundry, it will be necessary nevertheless to provide for the machine sluicing of badly fouled linen before it is despatched to the outside laundry.

(vii) Boiler plant

The boiler plant should preferably be housed separately and near to the departments using the most steam, such as laundry, and if possible the kitchen and C.S.S.D. There are advantages in a low level position, but this may necessitate a high chimney for the proper disposal of effluents. Ease of access for fuel deliveries is essential.

It is usual to group the workshops and works stores and the hospital transport garage and servicing bay in the boiler-house precinct. The main water storage tank and the water treatment plant, if any, may also be in this area, if the levels are suitable. Accommodation will be required for the calorifier and pumping plants, depending on whether they are centralised, or dispersed throughout the departments.

(viii) Provision for engineering services

The services required to distribute heat, water, gas, electricity and for ventilation are large, numerous and of increasing complexity. They require frequent servicing and maintenance and should be readily accessible. Electricity supplies may necessitate a sub-station.

(ix) Staff accommodation

It will be necessary to provide accommodation for staff who may be either non-resident or resident. For the non-resident staff, a central space will be needed containing cloakrooms, changing rooms, and toilet facilities. A proportion of the resident staff must be "on call" in case of emergency. As well as bedsitting rooms and small flats for nursing staff and some medical staff, it may be necessary to provide accommodation for married medical officers, in the form of self-contained houses or flats.

Resident staff accommodation should preferably be grouped in a quiet position located either within, or near to, the hospital grounds and near to the staff dining-rooms, though the accommodation for single resident medical staff should have convenient access

to the wards and casualty department.

Beside the car parks which will be provided, garage space and storage space for the bicycles of staff may be needed and should be sited with the staff accommodation.

The scope of this Building Note has been restricted to the important relationships between departments. It should not be overlooked that a chapel should always be provided. There should also be facilities for a library service.

III. The hospital as a whole

Design considerations

It may be useful at this stage to sum up for the newcomer to hospital design some of the points on departmental relationship which should be considered when the building plan for the hospital is prepared.

The hospital environment plays a most important part in hospital care. Each department has its own special physical requirements, and orientation is often important. Primary regard must be paid to the importance of ready access and communication between the key diagnostic and treatment departments, viz., radiology, operating theatres and pathology, to the wards on one hand and the out-patient services on another. This should be the focus of any scheme whether a new concept or the redevelopment of an existing site.

The designer should bear in mind the probability that there will be some internal modification and growth in the diagnostic and treatment departments and in the out-patient, casualty and admission departments. The building plan should not inhibit change and expansion in these departments.

Major schemes of redevelopment will usually have to be phased. It is essential to bear in mind, whenever hospital building is taking place in phases, that the hospital should, throughout these, preserve a unity of concept and progression over the site. All developments should be related to an overall plan for the whole.

Figure 11 illustrates how the departments can be grouped in relation to zones of activity. This should not be taken as a rigid pattern, but only as general guidance towards a building plan. The facilities required for a district general hospital have been considered as five main zones of activity which are illustrated by contrasting shading:

(*a*) Casualty and admission, out-patient department and administration

(*b*) Operating suites, diagnostic X-ray, pathology, pharmacy and physical medicine

(*c*) Wards

(*d*) Special departments

(*e*) Hospital services

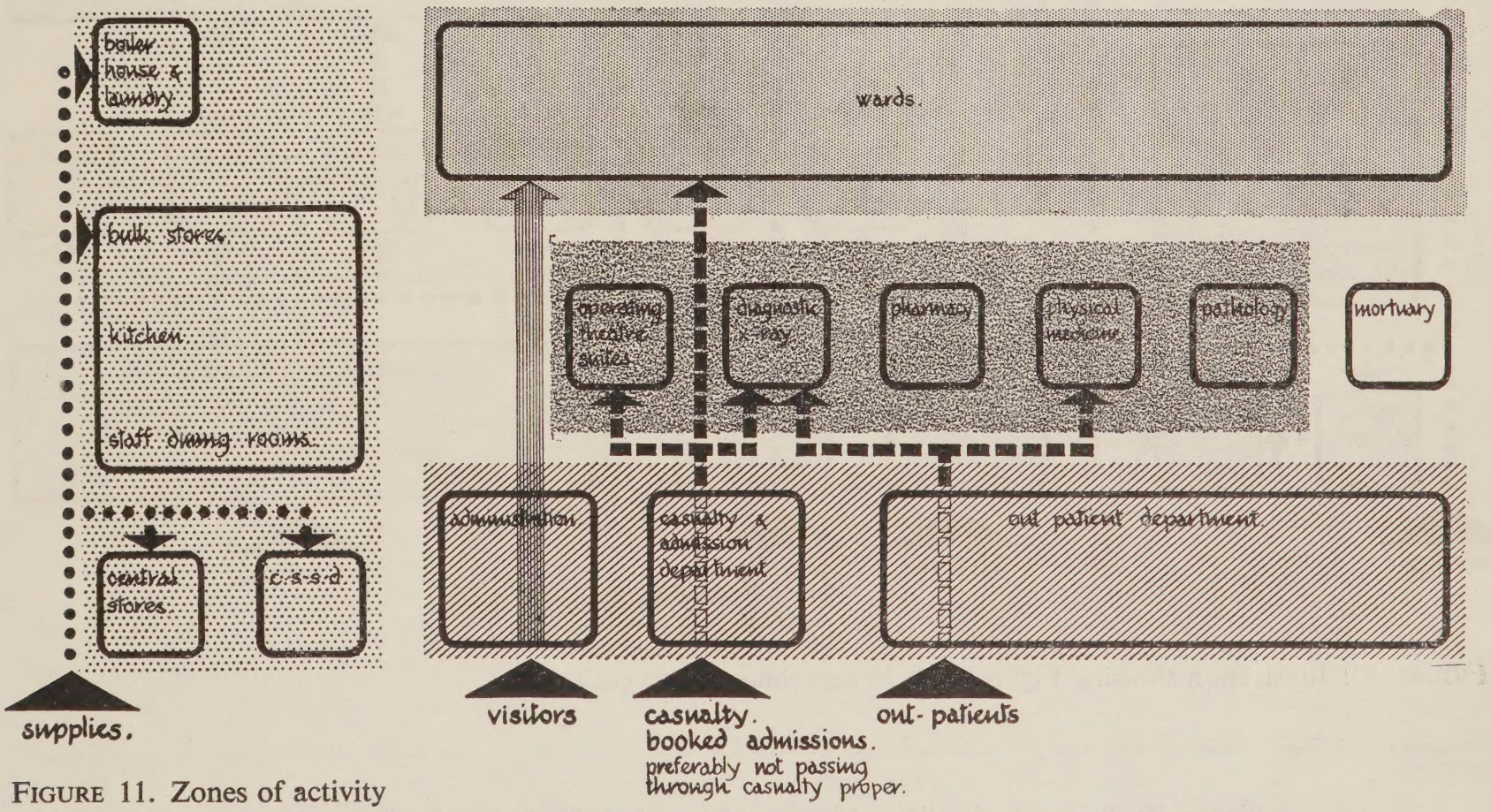

FIGURE 11. Zones of activity

Administration is included in group (*a*) in so far as it may deal with out-patient records, but it will be sited in relation to the whole hospital. The separate out-patient facilities (see paragraph II(iv)(*b*)) which may be provided in association with certain separated departments such as maternity, geriatric and psychiatric units should be noted, if they are not included as clinics in the main out-patient department.

Group (*b*). The constant use of these departments by those in groups (*a*) and (*c*) has a major influence on the design. The probable changes in scope and character of this group in the future cannot be over-emphasised. The operating theatres have been put into this group with which they will normally have to be planned, although their physical relationship is essentially with group (*c*) rather than with group (*a*).

Group (*c*). Wards should normally be grouped together with ready access to the departments in group (*b*).

Group (*d*). Special departments. This includes the maternity department, psychiatric department and geriatric and isolation unit, which, although dependent on the service facilities of the hospital, may or may not be provided as detached units and for that reason are not shown in the figures. In the same way, although they are grouped together as independent departments, there is no suggestion that they should be associated on the site.

Group (*e*). Hospital services. This includes boiler-house, laundry, kitchen and dining-rooms, C.S.S.D., and central stores. The central sterile department is included although its links are essentially with groups (*b*) and (*c*) and to a slightly less extent group (*a*). It is important to ensure that meals can be rapidly transported to the wards, and stores to wherever needed.

Building Note No. 1 stated that much of the building work of the future will probably be undertaken at existing sites. The points made in the foregoing paragraphs should be examined most carefully in the light of local needs and conditions whether building is on new sites or existing sites. Different problems will lend themselves to different architectural solutions, but unless the developments take place within a comprehensive plan which ensures from the outset the correct inter-relationship of departments the whole cannot be expected to function successfully. There can be little justification for a sprawling plan merely because the site permits it. On the other hand this does not mean that the problem should be thought of in terms of a monolithic building for this could conflict with the need to ensure that the design is flexible and such as would allow for the probable growth of the out-patient services and the diagnostic and treatment departments. Since the wards are certain to have departed from the confining pattern of the traditional "Nightingale" ward, they are least likely to be stultified in future by the rigidity of their envelope. Internal recasting of wards will be possible where extension of a diagnostic department housed in a tall building might not.

Figure 12 has been prepared in the form of the superimposing of Figures 1 to 10 one upon another, with, in addition, the routes for in-patients and booked admission, out-patients, visitors and services. This composite figure reinforces the need for convenient access and compact planning including quick access for visitors and convenient routes for the frequent delivery of goods. The communications which it shows arise from the relationship of groups of departments described above.

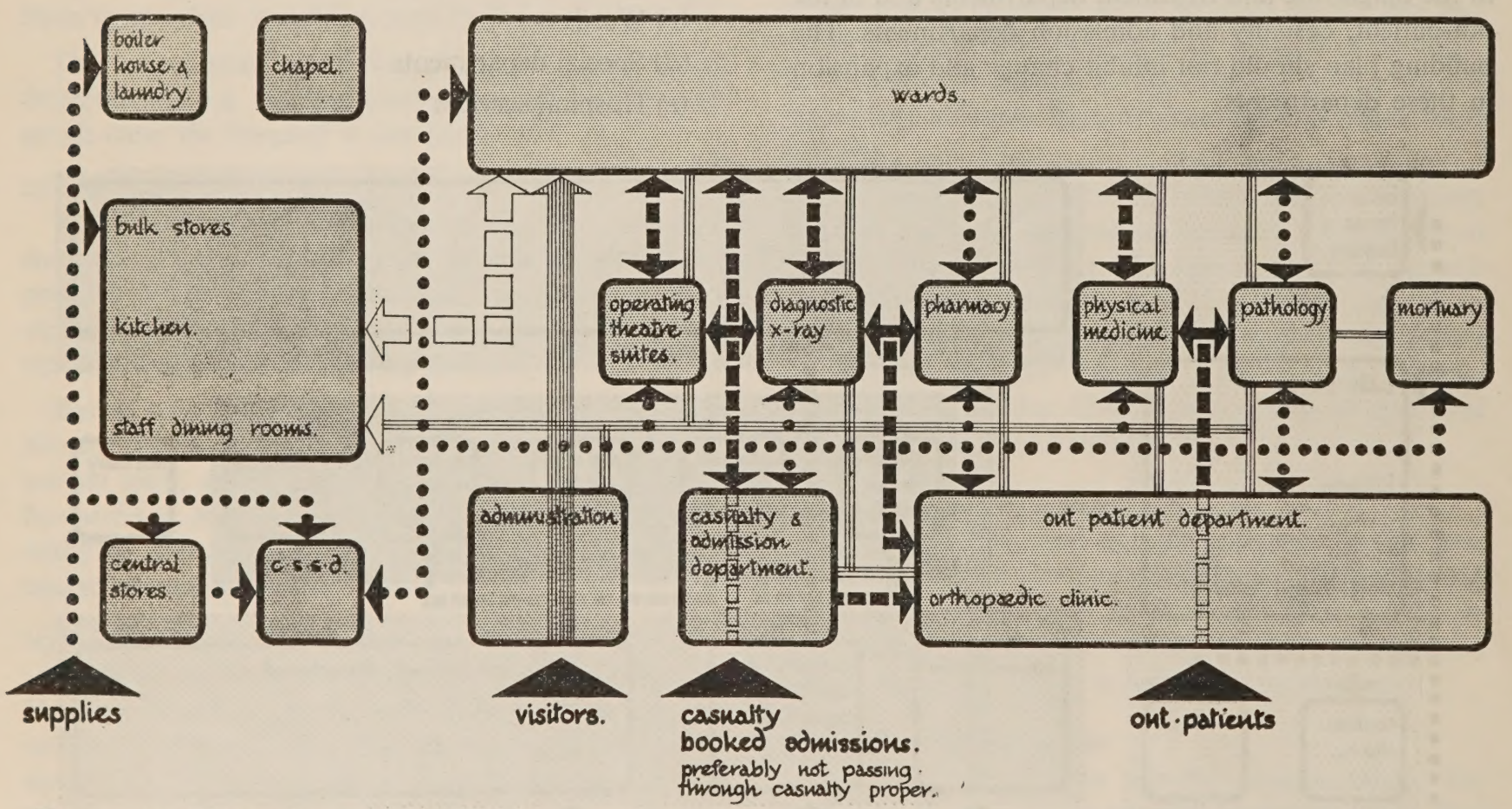

FIGURE 12. Illustration showing Figures 1 to 10 superimposed on each other

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